

# 2012 Summer School Diagnostics Exercises

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## Postprocessing Exercise

- Create a new postprocessing component "atmos\_dyn" in your copy of the AM3.xml file. Convert your output to a lat-lon grid. Regrid it to a pressure level set that includes 25 hPa. Refer to FRE User Documentation for the available options.
- Create a monthly time series in this component for zonal and meridional wind, for the year 2005 only. Refer to [[1]] for diagnostic variable descriptions.
- Create a seasonal time average in this component for the year 2005 only.
- Build the frepp command to generate the postprocessing output for this component, and run it. If your model run has not completed year 2005 yet, you may need to use sample data available in

```
/archive/niz/ssam2012/siena_201204/c48L48_am3p10_control/gfdl.ncrc2-intel-prod-openmp/history
```

- The postprocessing script may be run in batch or interactively. The job takes about a minute to run. When your job has completed, verify you have the files you expect with a freppcheck command such as:

```
freppcheck -a -v -c atmos_dyn -t openmp -p gfdl.ncrc2-intel -x xml-file  
experiment-name
```

- Use ncview or your favorite netcdf viewer to verify the output is what you expect.

## Analysis Exercise

### 1. UCAR's AMWG Package

UCAR's AMWG Diagnostics Package produces plots and tables from CCSM (CAM) monthly netcdf files. It is available for download on the web at

<http://www.cgd.ucar.edu/amp/amwg/diagnostics/index.html>.

GFDL scientist Charles Seman has adapted this package for use with GFDL's models. The analysis script template that can be inserted into the xml is located at:

```
/home/cjs/amwg_diag/stub/amwg_diag.csh
```

## 2. NASA JPL A-Train

NASA and its international partners operate several Earth-observing satellites that closely follow one after another along the same orbital “track.” This coordinated group of satellites, constituting a significant subset of NASA’s current operating major satellite missions, is called the Afternoon Constellation, or the A-Train, for short. (<http://atrain.nasa.gov/>)

GFDL scientist Charles Seman has created analysis scripts to create model-to-observation figures using NASA's A-Train datasets. The analysis script template that can be inserted into the xml is located at:

```
/home/cjs/fms.ana/fre-analysis/cjs/stub/jpl_atrain_atmos_av_mon.csh
```

### Your Turn!

For this exercise, please

- Add the appropriate tags to your XML file to run the analysis scripts. (Examine the analysis scripts to find out what source data they operate on.)
- Run the appropriate frepp command to generate figures from these analysis scripts.
- Locate and examine the figures that were produced.

## Parametrization and Diagnostics Exercise

Using the information about model parametrization, diagnostics, and post-processing presented in the class, design an experiment that is scientifically interesting to you. Change your XML as needed and run a three-year production model run. Here are some things to keep in mind for your experiment:

- You may wish to add one or more variables from the extended list of diagnostics [[2](#)] that are not in the simplified diagnostics table.
- Refer to Ni Golaz's slides for ideas on parametrization changes.